

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2018/2019

PMT0104 – FUNDAMENTAL MATHEMATICS I

(All sections / Groups)

29 MAY 2019

9.00 a.m. – 11.00 a.m.

(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of **3 pages** including cover page with **4 Questions** only.
2. Answer all **FOUR (4)** questions
3. Write all your answers in the answer booklet provided.
4. Only **NON-PROGRAMMABLE** calculators are allowed.

Question 1 (25 Marks)

a) Perform the indicated operations and simplify the result.

i. $\frac{5x+6}{x+1} + \frac{7x-3}{9x}$ (5 marks)

ii. $\frac{2x-2}{x} \cdot \frac{8x^2}{6x-6}$ (4 marks)

iii. $\frac{\frac{5}{7} + \frac{3}{x}}{\frac{2}{x} + 1}$ (6 marks)

b) Write the expression in standard form $a + bi$.

$$\frac{4 + 3i}{3 - 2i} \quad (6 \text{ marks})$$

c) Simplify the expression. Express the answer so that all exponents are positive.

$$\left(\frac{-2x^{1/3}y^{1/2}}{3z^{-5}} \right)^{-2} \quad (4 \text{ marks})$$

Question 2 (25 Marks)

a) Solve the equation.

i. $(2x - 1)(x + 3) = (2x + 1)(x - 3)$ (3 marks)

ii. $\frac{x-2}{x-5} = \frac{x+6}{x-7}$ (4 marks)

iii. $|3x + 5| + 2 = 8$ (5 marks)

b) Solve the quadratic equation by using given method.

i. $x^2 - 10x + 24 = 0$ (factoring) (2 marks)

ii. $x^2 + 3x + 4 = 0$ (completing the square) (5 marks)

c) Solve the inequality. Express the answer in interval notation.

i. $12 \leq 4x + 4 \leq 16$ (3 marks)

ii. $|2x - 3| < 6$ (3 marks)

Continued...

Question 3 (25 Marks)

- a) Given a function

$$f(x) = \frac{x^2 + 3}{2x - 4}$$

- i. Is point (3,5) on the graph of f ? (2 marks)
- ii. Find x when $f(x) = -2$. (3 marks)

- b) Graph the function using the techniques of transformations. Start with the graph of the basic function and show all the stages.

$$f(x) = (x + 4)^2 - 1 \quad (6 \text{ marks})$$

- c) Find the inverse of the following function.

$$f(x) = \frac{-5x + 2}{4x + 3} \quad (4 \text{ marks})$$

- d) Use the synthetic division to determine quotient and remainder when the function
- $f(x) = 3x^3 - 4x^2 + 2x - 10$
- is divided by

- i. $x + 2$ (5 marks)
- ii. $x - 1$ (5 marks)

Question 4 (25 Marks)

- a) Given a sequence

$$-3, 12, -48, 192, \dots$$

Find

- i. 7th term of the following sequence. (3 marks)
- ii. sum of the first 7 terms. (4 marks)

- b) Expand
- $(3x - 2)^4$
- by using Binomial Theorem. (4 marks)

- c) A straight line
- L
- containing two points,
- $P_1 = (2, -3)$
- and
- $P_2 = (-5, 4)$
- . Determine

- i. the distance from P_1 to P_2 . (3 marks)
- ii. the midpoint of the line segment joining P_1 and P_2 . (2 marks)
- iii. the equation of straight line containing P_1 and P_2 . (4 marks)
- iv. the equation of a parallel line to L that passing through point $(3, -1)$. (5 marks)

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